Remarks

Applicants note with appreciation the courtesy and professionalism of the Examiner during the recent Office Interview. As set forth in the Interview Summary (Paper No. 9), the proposed amendment overcomes the prior art as applied to date.

Claims 18-22 have been withdrawn consistent with Applicant's election of Claims 1-17 for immediate prosecution.

In the June 20, 2003 Official Action, the only two rejections to the claims are under §102. Claims 1-4 were originally rejected under §102(e) as anticipated by the Brandes '229 patent. Claims 1-2 and 5-9 were rejected under §102(e) as being anticipated by the Brandes '684 publication.

In response to the Office Action, and as discussed during the interview, Claim 1 has been amended to incorporate the citations of Claims 3 and 4 (now cancelled) and thus highlight and clarify the sequence of manipulative steps. These amendments also specifically recite that the epitaxial layer is grown on the surface of the silicon carbide substrate after the implanted phosphorus has been annealed and on the surface of the silicon carbide substrate that is opposite to the implanted surface. Furthermore, Claim 1 recites that the last step is the deposition of the metal layer on the implanted surface of the annealed silicon carbide to thus form the ohmic contact.

As set forth in the specification, this sequence of steps provides several advantages. First, it avoids any high temperature anneal of the structure after the epitaxial layers have been added. This is particularly important, because silicon carbide substrates are often used in conjunction with Group III nitride epitaxial layers, which tend to dissociate at the temperatures normally required to anneal an ohmic contact to silicon carbide.

Furthermore, this sequence of steps also permits the epitaxial layers to be added prior to the addition of, and thus in the absence of, the ohmic contact. Absent this sequence (*e.g.*, if the ohmic contact were added prior to the epitaxial layers), the presence of the metal during



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epitaxial growth would raise its own set of additional problems. These particular advantages are also set forth in the specification (*e.g.*, Paragraphs 50 and 51).

Neither of the Brandes references disclose or suggest this order of operations. The Brandes '229 patent discloses a resistor element formed of amorphous silicon carbide of potentially non-stoichiometric composition which is used is conjunction with some different, "suitable substrate" (Column 7, line 42), upon which a layer of glass or silicon dioxide is added (Column 7, lines 47-54), following which the electrode layer (3 in Figure 1A) is added, following which the amorphous silicon carbide is added. Thus, although Brandes '229 suggests that the amorphous silicon carbide can include phosphorus as an impurity (*e.g.*, Column 3, line 11) and likewise suggests that the combination can be annealed (Column 7, lines 25-29), Brandes '229 fails to disclose or suggest the specific steps of the claimed invention.

The Brandes '684 publication suffers from similar defects. It discloses an amorphous silicon carbide layer 12 (Paragraph 59) on an infrared transparent window 11 (Paragraph 60), followed by a glue layer 22 (Paragraph 60) and an amorphous silicon carbide layer 23 (Figure 2C; Paragraph 60). Again, although Brandes '684 indicates that phosphorus can be included as an impurity in the amorphous silicon carbide (*e.g.*, Paragraph 68) and includes an ohmic contact (115) to the amorphous SiC (113), Brandes '684 fails to disclose or suggest the order of steps or the geometry of the claimed invention.

Applicants accordingly submit that all of the Examiners' grounds of rejection have been met by the claims as presently amended and the arguments set forth herein, and immediate allowance is respectfully requested.

Respectfully submitted,

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**CERTIFICATE OF FACSIMILE TRANSMISSION**

I hereby certify that this correspondence is being transmitted by facsimile to the U.S. Patent and Trademark Office, c/o Technology Center 2800, Attn: Examiner David Vu, at facsimile number 703-872-9318 on July 17, 2003.

Philip Summa